

IN THE CLAIMS:

Claim 1 (currently amended) A surface treatment method comprising (a) providing in which the surface of recorded matter comprising a recording medium in which images are recorded, on a recording medium is treated using and (b) treating a surface of the recorded matter in which the images are recorded with a treatment agent comprising at least one sulfur compound selected from the group consisting of thiocyanic acid, thiosulfuric acid, thiourea, a thio ether compound, a hetero-ring-containing thiol compound, a sulfur halide, sulfur oxyhalide, a halogenosulfonic acid and a derivative of these compounds.

Claims 2 and 3 (cancelled)

Claim 4 (withdrawn) The surface treatment method according to claim 2, wherein said nitrogen compounds consist of one or more compounds selected from the group consisting of aliphatic amine compounds, alicyclic amine compounds, aromatic amine compounds, quaternary ammonium salts, polyamines and polyamine derivatives, amine condensates, amino acids and amino acid derivatives.

Claim 5 (withdrawn) The surface treatment method according to claim 2, wherein said fluorine compounds consist of nonionic, cationic or anionic fluorine-atom-containing surfactants, or fluorine-modified resins.

Claim 6 (withdrawn) The surface treatment method according to claim 2, wherein said natural resins consist of one or more compounds selected from the group consisting of carnauba wax, beeswax, rice wax, Japan wax, hohoba oil, spermaceti, candelilla wax, lanolin, montan wax, ozokerite, ceresin, paraffin wax, microcrystalline wax and petrolactam.

Claim 7 (withdrawn) The surface treatment method according to claim 2, wherein said synthetic resins consist of one or more compounds selected from the group consisting of cellulose type resins, vinyl type resins, acrylic type resins, polyester resins, silicone oils, UV-curable resins, thermosetting resins, polyurethane resins, modified epoxy resins and phenol resins.

Claim 8 (currently amended) The surface treatment method according to claim 12, wherein said treatment agent contains in addition to the at least one sulfur compound, at least one other compound ~~a mixture of two or more compounds~~ selected from the group consisting of ~~sulfur compounds~~, a nitrogen compounds compound, a fluorine compounds compound, a natural resins resin and a synthetic resins resin.

Claim 9 (currently amended) The surface treatment method according to claim 1 2, wherein said recording medium is a recording medium in which an ink receiving layer is disposed on a support.

Claim 10 (currently amended) The surface treatment method according to claim 1 2,

wherein said treatment is a spray treatment, blowing treatment, coating treatment, immersion treatment or treatment using an ink jet recording head.

Claim 11 (withdrawn) The surface treatment method according to claim 1, wherein said treatment agent is an aqueous solution which contains a water-soluble resin, a light resistance improving agent and an ink fixing agent, and said water-soluble resin is a resin which, when applied to the surface of an image of printed matter (printed matter in which the water-resistant base material in the recording medium is a water-resistant paper with an oxygen permeability of $30 \text{ cc}/(\text{m}^2 \times \text{D} \times \text{atm})$ or more in an environment with a temperature of 20°C and a relative humidity of 90%, and in which images have been formed in the ink receiving layer by means of a dye ink) at the rate of $7 \text{ g}/\text{m}^2$, is capable of limiting the oxygen permeability of said printed matter in an environment with a temperature of 20°C and a relative humidity of 90%, to a value of $10 \text{ cc}/(\text{m}^2 \times \text{D} \times \text{atm})$ or less.

Claim 12 (withdrawn) The surface treatment method according to claim 11, wherein said treatment agents contains said water-soluble resin at the rate of 1 to 70 wt %, said light resistance improving agent at the rate of 0.01 ~ 20 wt %, and said ink fixing agent at the rate of 0.01 ~ 10 wt %.

Claim 13 (withdrawn) The surface treatment method according to claim 11, wherein said treatment agent further contains an alcohol, and the content of said alcohol is 1 ~ 80 wt %.

Claim 14 (withdrawn) The surface treatment method according to claim 11, wherein said water-soluble resin is an ethylene - polyvinyl alcohol copolymer or a polyvinylidene chloride.

Claim 15 (withdrawn) The surface treatment method according to claim 11, wherein said light resistance improving agent consists of one or more agents selected from the group consisting of ultraviolet absorbing agents and hindered amine type light stabilizers.

Claim 16 (withdrawn) The surface treatment method according to claim 11, wherein said ink fixing agent consists of one or more agents selected from the group consisting of cationic organic substances.

Claim 17 (withdrawn) The surface treatment method according to claim 11, wherein the treatment performed using said treatment agent is performed by a method in which said untreated printed matter is immersed in said treatment agent, or a method in which said treatment agent is sprayed onto said untreated printed matter.

Claim 18 (withdrawn) The surface treatment method according to claim 11, wherein said printed matter obtained by treatment with said treatment agent and drying is treated with said treatment agent so that a protective layer with a thickness of 0.1 to 50 mm is disposed on said ink receiving layer.

Claim 19 (withdrawn) The surface treatment method according to claim 11, wherein said printed matter is printed matter that is recorded on said recording medium by ink jet recording using said dye ink.

Claim 20 (withdrawn) The surface treatment method according to claim 1, wherein said treatment agent is comprised of oil and fat as a main component.

Claim 21 (withdrawn) The surface treatment method according to claim 20, wherein said oil and fat consist of linolic acid, oleic acid, linolenic acid, palmitic acid, stearic acid or two or three types of glycerol esters of these acids.

Claim 22 (withdrawn) The surface treatment method according to claim 20, wherein said treatment agent further contains an oil-soluble anti-oxidant.

Claim 23 (withdrawn) The surface treatment method according to claim 20, wherein said treatment agent further contains an oil-soluble ultraviolet absorbing agent.

Claim 24 (withdrawn) The surface treatment method according to claim 20, wherein said treatment agent further contains an oil-soluble light stabilizer.

Claim 25 (withdrawn) The surface treatment method according to claim 20, wherein said recording medium is a recording medium in which an ink receiving layer is disposed on a base material.

Claim 26 (withdrawn) The surface treatment method according to claim 20, wherein said treatment is a spray treatment, blowing treatment, coating treatment or immersion treatment.

Claim 27 (withdrawn) The surface treatment method according to claim 25, which is characterized in that said ink receiving layer contains silica and/or alumina.

Claim 28 (withdrawn) The surface treatment method according to claim 25, which is characterized in that the void ratio of said ink receiving layer is 30% or greater.

Claim 29 (withdrawn) The surface treatment method according to claim 20, wherein said recording medium has a resin-coated paper as a base material.

Claim 30 (withdrawn) The surface treatment method according to claim 1, wherein said treatment agent is comprised of an oil-form substance as a main component.

Claim 31 (withdrawn) The surface treatment method according to claim 30, wherein the oil-form substance is a nonvolatile liquid at ordinary temperatures.

Claim 32 (withdrawn) The surface treatment method according to claim 30, wherein the boiling point of the oil-form substance is 200°C or greater.

Claim 33 (withdrawn) The surface treatment method according to claim 30, wherein

the boiling point of the oil-form substance is 300°C or greater.

Claim 34 (withdrawn) The surface treatment method according to claim 30, wherein the oil-form substance is a mineral oil.

Claim 35 (withdrawn) The surface treatment method according to claim 30, wherein the oil-form substance is liquid paraffin.

Claim 36 (withdrawn) The surface treatment method according to claim 30, wherein said treatment agent further contains an oil-soluble anti-oxidant.

Claim 37 (withdrawn) The surface treatment method according to claim 30, wherein said treatment agent further contains an oil-soluble ultraviolet absorbing agent.

Claim 38 (withdrawn) The surface treatment method according to claim 30, wherein said treatment agent further contains an oil-soluble light stabilizer.

Claim 39 (withdrawn) The surface treatment method according to claim 38, wherein the oil-soluble light stabilizer is a hindered amine type compound.

Claim 40 (withdrawn) The surface treatment method according to claim 30, wherein said recording medium is recording medium in which an ink receiving layer is disposed on a base material.

Claim 41 (withdrawn) The surface treatment method according to claim 30, wherein said treatment is a spray treatment, blowing treatment, coating treatment or immersion treatment.

Claim 42 (withdrawn) The surface treatment method according to claim 40, which is characterized in that said ink receiving layer contains silica and/or alumina.

Claim 43 (withdrawn) The surface treatment method according to claim 30, which is characterized in that the void ratio of said ink receiving layer is 30% or greater.

Claim 44 (withdrawn) The surface treatment method according to claim 30, wherein said recording medium uses a resin-covered paper as a base material.

Claim 45 (withdrawn) The surface treatment method according to claim 1, comprising the steps of:

detecting the type of said recording medium;

determining the type of treatment agent in accordance with the detected type of said recording medium; and

discharging said determined treatment agent onto said recorded surface so that a protective layer that protects this recorded surface is formed.

Claim 46 (withdrawn) A treatment agent which is used in the surface treatment method according to claim 1.

Claim 47 (withdrawn) A surface-treated product which is characterized in that recorded matter is treated using the surface treatment method according to claim 1.

Claim 48 (withdrawn) A surface treatment apparatus for recorded matter in which the surface of recorded matter in which images are recorded on a recording medium is treated using a treatment agent, said surface treatment apparatus comprising a treatment agent discharge part which discharges the treatment agent according to claim 1 onto the recorded matter.

Claim 49 (withdrawn) The surface treatment apparatus according to claim 48, which further comprises:

- a paper supply and discharge port;
- a treatment agent wiping part;
- a paper feeding part; and
- driving means for driving said treatment agent discharge part and paper feeding part.

Claim 50 (withdrawn) The surface treatment apparatus according to claim 48, which is characterized in that said surface treatment apparatus is a printer, and said printer comprises an ink discharge part which discharges ink onto the recording medium, and a treatment agent discharge part which is disposed on the after-side of said ink discharge part with respect to the feeding direction, and which discharges the treatment agent onto the recorded matter.

Claim 51 (withdrawn) The surface treatment apparatus according to claim 50, which further comprises a treatment agent wiping part.

Claim 52 (withdrawn) The surface treatment apparatus according to claim 48, which is characterized in that said surface treatment apparatus is a surface treatment kit, and said surface treatment kit comprises treatment agent coating means for applying the treatment agent to the recorded matter as a coating, and wiping means for [wiping] this treatment agent.

Claim 53 (withdrawn) The surface treatment apparatus according to claim 48, which is characterized in that said surface treatment apparatus is a surface treatment kit, and said surface treatment kit comprises treatment agent coating means for applying the treatment agent to said recorded surface while directly contacting said coating surface.

Claim 54 (withdrawn) The surface treatment apparatus according to claim 53, which is characterized in that said surface treatment kit comprises wiping means consisting of an elastic member for wiping away the excess portion of the treatment agent that is applied to said recorded surface as a coating.

Claim 55 (withdrawn) The surface treatment apparatus according to claim 54, wherein said wiping means comprise a member that has liquid absorbing properties.

Claim 56 (withdrawn) The surface treatment apparatus according to claim 53, wherein

said surface treatment kit has a treatment agent coating apparatus which comprises a tank member that accommodates said treatment agent, and a coating head that has said treatment agent coating means.

Claim 57 (withdrawn) The surface treatment apparatus according to claim 56, wherein a cap member that protects said coating head is attached to said coating head in a detachable manner.

Claim 58 (withdrawn) The surface treatment apparatus according to claim 56, wherein a replenishment port for replenishing the treatment agent is formed in said tank member.

Claim 59 (withdrawn) The surface treatment apparatus according to claim 56, wherein said tank member is formed from a material that is insoluble with respect to said treatment agent.

Claim 60 (withdrawn) The surface treatment apparatus according to claim 53, which comprises coating amount adjustment means for adjusting the coating amount of the treatment agent from the treatment agent coating means.

Claim 61 (withdrawn) The surface treatment apparatus according to claim 53, wherein recording is performed on said recording medium by an ink jet system.

Claim 62 (withdrawn) The surface treatment apparatus according to claim 50, which is characterized in that said printer has a treatment agent cartridge that accommodates at least two different types of treatment agents.

Claim 63 (withdrawn) The surface treatment apparatus according to claim 62, wherein said treatment agent cartridge accommodates at least a lustering liquid and a matte finishing treatment liquid.

Claim 64 (withdrawn) The surface treatment apparatus according to claim 50, which is characterized in that said printer has an ink cartridge which comprises at least one ink accommodating compartment that accommodates at least one type of ink, and treatment agent accommodating compartments that accommodate at least two different types of treatment agents.

Claim 65 (withdrawn) The surface treatment apparatus according to claim 64, wherein said ink cartridge accommodates at least a lustering liquid and a matte finishing treatment liquid.

Claim 66 (withdrawn) The surface treatment apparatus according to claim 50, which is characterized in that said printer comprises detection means for detecting the type of the recording medium, and control means for determining which of said two or more types of treatment agents is to be applied to the recorded surface as a coating in accordance with the type of recording medium.

Claim 67 (new). The surface treatment method according to claim 1, wherein the at least one sulfur compound is present in the treatment agent in an amount effective to improve both a light resistance and a gas resistance of the recorded matter treated with the treatment agent in step (b) as compared with recorded matter which has not been so treated.

Claim 68 (new). The surface treatment method according to claim 67, wherein the at least one sulfur compound is selected from the group consisting of a thiocyanate, thiosulfuric acid, and thiourea.